9942
208
W48

# Engineering Record

## Building Record and Sanitary Engineer

LIBRARY
UNIVERSITY OF ILLINOIS
URBANA

Volume 71
*January-June, 1915*

McGraw Publishing Company, Inc.
239 West 39th Street
New York

U OF I
LIBRARY

ER
v.71

# Index to Volume 71

## *January-June, 1915*

---

## GENERAL INDEX

### A

- Aberdeen, S. D., reservoir, rectangular, fire service, *260
- Aberthaw Construction Co., Boston, concrete briquettes, tests, *275
- Abutment, repaired with concrete, *337
  - wooden, costs, Trent River bridge, *44
- Adams, F.:
  - Water-filter of new type, tested at Toronto, employs "drifting sand" principle, *464
- Aero tank, tests, Baltimore, *521, e 511
- Aeroscope, Panama-Pacific Exposition, *423
- Affleck, B. F., becomes President of Universal Portland Cement Co., *215, e 191
- Agriculture department, office of public roads and rural engineering, e 65, 312
- Air analyzer, cement tests, 737
- Airship raids, e 158
- Akron, Ohio, filtration plant, *580
  - refuse disposal, plants, *63
- Alaska, coal, free, n 118
  - railroad, report of work, n 817
  - railroad, U. S. government, *482, e 477, e 479
  - road, construction, costs, *764, e 761
- Alaskan Railway Commission, resolution passed by American Society of Civil Engineers, n 216
- Alien Labor Law, e 36, e 287
  - Arizona, e 65, n 91, n 381
  - delays, subway work, n 29, n 381
  - New York state, amended, 343
  - unconstitutional, 61
  - upheld, 311
- Allen, V. D.:
  - How Cleveland fixes sizes of courts and yards, *614
- Allison, L. W.:
  - Co-operative road administration plan aided by post card bulletins, *143
- Alton, Ill., sewer tunnel, 181
- Aluminum sulphate, water purification, abs. 394
- American Bridge Company, exhibition of full-size sections and typical steel construction at Panama Exposition, n 819
- American Concrete Institute, e 158
  - Wason medal, n 248
- American-Hawaiian Steamship Co. pier, San Francisco, *231
- American Highway Association, road laws, 249
  - year book, 602
- American Institute of Electrical Engineers, status of engineer, 248
- American Railway Engineering Association, committee work, assigned, 526
  - convention, Chicago, 411
  - railroad, economies, 370
  - summary of work, 374
- American Society for Testing Materials, M. S. Merriman elected president, n 818
- American Society of Civil Engineers, annual meeting, 122
  - appropriation for committee work, 728
  - committee work, e 128
  - district organization, 570, e 574
  - endorses plan of Alaskan Railway Commission, n 216
  - needs, e 67
  - represented, New York State constitution, revision, n 92
  - special technical committees, rules, 121
- American Society of Mechanical Engineers, Boiler Code Commission, summary of work, e 220
- American Waterworks Association, convention, e 573, abs. 643
  - Illinois section, filter, abs. 338
  - National Waterworks Association proposed, 635
- American Wood Preservers' Association, membership, 155
- Angier, F. J.:
  - Sill ties—treated or untreated timber, or concrete? *105
- Aqueduct, construction, Winnipeg, *594, e 573
  - Los Angeles, irrigation, n 31
- Arch, tile, floor, tests, *432
- Architect, licensing, Illinois, e 190
  - registration, e 706
  - registration law in N. Y., 706, 743
  - report of licensed, l 533
- Argentina, Cacheuta, hydroelectric plant, n 233
- Arizona, Lyman dam, failure, *537
- Arkansas, drainage, plant, *41
- Armstrong, J. W.:
  - Baltimore filters abound in useful hints on concrete construction and design, *583
- Arrowrock dam, valves, *208
- Ashburner, C. E., city manager of Springfield, Ohio, 169
- Ashland, Wis., water-rate, decision, *805
- Asphalt, rehabilitation plant, New York, *647
  - still, wooden column, failure, n 125a
- Asphalt pavement. (See Pavement, asphalt)
- Asphalt plant, Rio de Janiero, *737
- Associated Factory Mutual Fire Insurance companies, dry rot in timber, 336, e 317
- Atchison, Topeka & Santa Fe, solves problem, Chicago freight terminal, n 819
- Atlanta, Ga., garbage disposal, case 777, e 761
- Auditorium, Panama-Pacific Exposition, *237
  - lighting, *238
- Auerbach company, factory building, *177
- Austin, Texas, dam, reinforced concrete, *672, e 669, *707, *750
- Automobile, electric, street sprinkler, Calgary, Can., *117
  - geological survey work, costs, *490
  - "Jitney" bus, e 221
    - Los Angeles, e 513
  - road-inspection, Wisconsin, n 814
  - traffic, Massachusetts, 111
  - truck, costs, e *211
    - for snow removal, *215
    - freight, costs, *403
    - garbage collection, Los Angeles, 394
    - handling, 52
    - hauling concrete, *469
    - load limit, n 262
    - moves heavy machinery, *786
    - ordinance, Chicago, 727
    - road, sprinkling, costs, *520

### B

- Bainbridge, C. N.:
  - Compares costs of bridges for grade crossing elimination, abs. *770, e 761
- Baker, H. S.:
  - Chicago's New Tunnel and Pumping Station, Part II, *103, e 157
- Baltimore, Fallsway viaduct, construction, *544
  - filtration plant, construction, *583
  - sewage treatment, tests, *521, e 511, l 784
- Baltimore Sewage Commission, treatment of sewage, experiments, e 219
- Bancroft, G. H.:
  - Water turbine characteristics, *45, e 35
- Barbour, F. A.:
  - Low-lift centrifugal pumps at Akron will operate under unusually varied conditions, *580
- Barge, concrete, Panama Canal, *684
  - self-propelled, Mississippi River, 312
- Barge Canal, New York, appropriation, n 568
  - 160 miles opened, n 539
- Barren Island, garbage reduction plant, odor elimination, e 793
- Barrett, F. L.:
  - Pumping through well points aids excavation in quicksand, 277
- Bartow, E.:
  - Treat Illinois sewage with activated sludge, abs. *421
- Battleship, propulsion, turbine-electric, e 607
- Beam, concrete, forms, *120
  - design, method, nomographic chart, *809
  - shear, *25
  - steel I tests, Cornell University, 746
- Beaumont, Texas, water terminal, *721
- Belgian Relief Commission, organized by engineers, *538, e 511
- Belle Fourche project, siphon, wood stave, failure, *632
- Belle Isle Bridge, Detroit, fire, wrecks, 599
  - replaced, *633
- Bending machine, for structural shapes, *214
- Bennett. J. G.:
  - Remodeled high-speed mower, cuts large weeds and brush, *119
- Biersach, F. M.:
  - Unwieldy tanks are raised to steel supports at wood block plant, *629
- Bilger, H. E.:
  - Believes in eliminating concrete road joints. abs. 198
- Binghamton, N. Y., tree census, n 499
- Blasting, hydraulic mining, cartridge, *28
- Bloomington, Ill., locomotive repair shops, *487
- Blueprints, discarded, utility, l 88
- Boat, drilling and sounding, *756
- Boehringer, R. A.:
  - Collection and use of stream discharge data in Pennsylvania, *109
- Boiler code, A. S. M. E., endorsed, 471
- Boiler Code Commission. (See American Society of Mechanical Engineers, Boiler Code Commission)
- Boise, Idaho, Arrowrock dam, valves, *208
- Bookcase, sectional, *l 276
- Book reviews:
  - Abbott,H. Concrete pile standards, 243
  - American Society for Testing Materials. Proceedings of 17th annual meeting, 117
  - Andrews, E. S. Further problems in the theory and design of structures, 659
  - Armstrong, H. F. Descriptive geometry, 405
  - Backert, A. O. Ed. A. B. C. of iron and steel, 813
  - Bakenhus, Knapp & Johnson, Panama Canal, 436
  - Bowie, W. Primary Triangulation on the One Hundred and Fourth Meridian and on the Thirty-ninth Parallel, in Colorado, Utah, and Nevada, 55
  - Burchard, E. F. Production of coal in 1913, 55
  - Burrows, C. H. Oxyacetylene welding and cutting, 658
  - Carnegie Library of Pittsburgh, Air conditioning, 55
  - Church, A. H. Science and practice of management, 179
  - Conklin, C. D. Structural steel drafting and elementary design, 306
  - Dales, J. H. Manual of mechanical drawing, 55
  - Dana, R. T. Handbook of construction plant, 497
  - Daniels, F. E. Operation of sewage disposal plants, 563
  - Davies, J. P. Engineering office systems and methods, 498
  - Deussen, A. Geology and underground waters of the southeastern part of the Texas Coastal Plain. U. S. Geol. survey, water supply paper No. 335, 149
  - Dougherty, R. L. Centrifugal pumps, 532
  - Eddy, H. P. American sewerage practice, design of sewers, Vol. I-II, 149, 466
  - Engels, H. Handbuch des Wasserbaues, 179
  - Engineering Directory for 1915, 338
  - Export trade directory, Edition 4, 55
  - Ferguson, W. B. Art of Estimating the Cost of Work, 532
  - Fish, J. C. L. Engineering Economics, 625
  - Fleming, B. P. Practical Irrigation and Pumping, 436
  - Fortier, S. Use of Water in Irrigation, 243
  - Griffen, C. L. Machine Drawing, 56
  - Gullanden, Per. Theory of Foundation Piling, 306
  - Horton, A. H. Water Resources of Illinois, 55
  - Howe, M. A. Foundations, 117. Masonry, 467
  - Interstate Commerce Commission, Report, 1912, 55
  - Ives, H. C. Surveying Manual, 56
  - Jayne, S. O. Wood Pipe for Conveying Water for Irrigation. U. S. Department of Agriculture, Bulletin 155, 149
  - Jones, W. H. Mechanism of Steam Engines, 210
  - Julian, Julian. Introduction to Town Planning, 497
  - Kershaw, G. B. Sewage Purification and Disposal, 531, l. 814
  - Knoeppel, C. E. Installing Efficiency Methods, 211
  - Kunz, F. C. Design of Steel Bridges, 531
  - Lauchi, Eugene. Tunneling, 626
  - McCarty, R. J. Federal Valuation of Railroad Property, 563

*, illustrated articles; l, letters to the editor; e, editorials; n, news of the week and filler notes.

316 (2V)

330576

Book Reviews: (Continued)
  MacGeachy, C. E. A. Who Started the Panama Canal and Its Railroad? 723
  McGraw Waterworks Directory, 648
  Matthews, N. Municipal Charters, 56
  Milan, J. Plain and Reinforced Concrete Arches, 498
  Merriman, M. Mechanics of Materials, 117
  Metcalf, L. American Sewerage Practice, Vol. I-II, Construction of Sewers, 149, 466
  Mills, A. P. Materials of construction, 813
  Moritz, E. A. Working Data for Irrigation Engineers, 498
  Myers, D. M. Preventing Losses in Factory Power Plants, 499
  National Lime Manufacturers' Association. Proceedings of 12th Annual Meeting, 1914, 55
  Nickel, F. F. Direct-acting Steam Pumps, 658
  Oregon State Highway Engineer, First Annual Report, 243
  Paint Manufacturers' Association of the United States. Education Bureau, Bulletin 46 on Paint, 55
  Parsons, J. L. Land Drainage, 339
  Pennsylvania. Water Supply Commission, Reports 1910-1912, 55
  Pepperman, W. L. Who Built the Panama Canal? 499
  Perkins, L. Railroad taper, 812
  Raymond, W. G. Railroad Field Manual for Civil Engineers, 723
  Richey, A. S. Electric Railway Handbook, 625
  Ricketts, P. C. History of Rensselaer Polytechnic Institute, 118
  Rideal, Samuel. Water Supplies—Their Purification, Filtration and Sterilization, 339
  Riggs, N. C. Hancock's Applied Mechanics for Engineers, 497
  Semenza, G. Graphical Determination of Sags and Stresses for Overhead Line Construction, 149
  Semenza, M. Graphical Determination of Sags and Stresses for Overhead Line Construction, 149
  Shurtleff, F. Carrying Out the City Plan, 437
  Slocum, S. E. Elements of Hydraulics, 338
   Resistance of Materials, 118
  Smith, A. W. Materials of Machines, 179
  Smith, C. W. Construction of Masonry Dams, 210
  Thayer, H. R. Structural Design, Vol. II. Design of Simple Structures, 243
  United States Bureau of Standards. Annual Report for 1914, 149
  United States Coast and Geodetic Survey, Report 1914, 55
  United States Geological Survey. Water Supply Papers, Nos. 326-375, 55
  United States Reclamation Service. Report on Iron Canyon Project, 338
  United States Surveys Bureau. Report on Collection and Treatment of Philadelphia's Sewage, 723
  University of Minnesota, Current Problems, No. 3, 55
  Van Ornum, J. L. Regulations of Rivers, 436
  Weiss, H. F. Preservation of Structural Timber, 118
  Whitten, R. H. Valuation of Public Service Corporations, Part II, 306
  Widtsoe, J. A. Principles of Irrigation Practice, 405
  Woodman, A. G.: Air, Water and Food from a Sanitary Standpoint, 406
Borden, H. P.:
  Erection of new Quebec bridge, *80
Boring record, misleading, *554, e 541
  preservation, e 1, n 29
Boston, harbor facilities, increase proposed, *642
  Revere Beach, coast protection, 429, l 628
   erosion prevented, *429
Boston Elevated Railroad, safety, 300
Bower, T. T.:
  Justifiable expenditure for tie treatment, 106
Bowie, W.:
  Record leveling on geodetic survey abs. 807
Bowlby, H. L.:
  Use of hydrated lime in concrete, abs. 379
Bowser, J. T.:
  Complete new track entirely before putting it in service, 614
  Fouling of suction lines at small water stations overcome, 555
  Reinforced concrete for railway water tanks, *81
Brick, handling, locomotive crane, *60
  laying, costs, *90
Bridge, arch., Chester, Pa., 164
  concrete arch forms fall, Cleveland, O., *798
  construction, Alaska, *764, e 761
   Chehalis River, bascule bridge, *17
   development, 7
   Fallsway viaduct, Baltimore, *544
   Hell Gate, *568
Bridge construction: (Continued)
   New Philadelphia, Ohio, *78
   Quebec, *80
   Trent River, *44
  design, Iowa, 138
  double-deck, Kansas City, Mo., *164
  erection, *181
  fire damage, Phoenixville, Pa., 633
   Vancouver, B. C., *633
  fire prevention, e 605
  floor, *164
   creosoted wood blocks, l 724
  foundation, wood cofferdams sunk, *534
  girder, pipes replace, *688
  grade-crossing, cost, *770, e 761
  Harrisburg, Pa., Cumberland Valley R. R., *326
  Hell Gate, steel handling record made, *399
  lift, construction, *611
  Monroe Street, Spokane, Wash., *235
  placing new span, Harlem River, *341
  placing, railroad, Milwaukee, Wis., *462
  plan, Hudson River, failure, n 30
  pontoon, construction, 29
   railroad, Panama Canal, *270
  Quebec, traction stresses, *492, e 477
  reinforced concrete, Kansas City, Mo., *164
  reinforced concrete, unit girders, *172
  Sciotoville, riveted truss spans, longest in America, *799, e 793
  Southwark, London, replaced, *720
  steel, erection, Spokane, *564
   flooring, costs, 300
  substructure construction, Memphis, Tenn., *518
   railroad, Pekin, Ill., *425
  suspension, Pacific Northwest, 529
   Washington National Forest, n 341
  Trent avenue subway, Spokane, Wash., *234
  wood, arch, construction, Chattanooga, Tenn., *142
   eleven-span, l 438
British Columbia, Kettle Valley Railroad completed, n 818
  North and South railroad, nears completion, n 818
  water-right, investigation, n 810
Britton, J. A.:
  Development of water power on public lands, abs. *75
Brown, J. M.:
  Preliminary estimating of grading simplified, 610
Brooklyn Bridge, subway connection, *76
Brooklyn Rapid Transit, tunnels, shaft sinking, *522
Brotherton, W. H.:
  Light traveler cheapens sheeting of trench across river, *439
Bubbly Creek, Chicago, sewage, tests, *266
Buenos Aires, Argentina, drainage department, *304
Buffalo, N. Y., Delaware, Lackawanna & Western R. R. station, *334
Buffalo, Chicago Street viaduct, maintenance, 635
Buffalo, Rochester and Pittsburgh, roundhouse at DuBois, Pa., *167, *290
Building, brick, laying, costs, *90
  collapse, frozen concrete, *271
  Commissioners and Inspectors Convention, 667
  concrete, damage by fire, *240, e 219, n 248
   expansion and contraction, *621
  construction, auditorium, Panama-Pacific Exposition, *237
   Chicago, n 275
   San Francisco, *222, e 220
   steel bank, *713
   underground, *630
  design, Panama-Pacific Exposition, *229
  Edison plant, West Orange, N. J., *503, e 477 *n 524
  elevators and concrete work, *755
  excavation, costs, 68
  factory, *177
  floor construction, *748
  hotel, moved, San Francisco, *289
  law, Massachusetts, 345
  Navy Yard, contractor's bid, n 31
  office, Northwestern Mutual Life Insurance, Milwaukee, *205
   wind stresses, n 539
  railroad terminal, Buffalo, N. Y., *334
  restoration, Edison plant, *40, *72
  roof, steel, erecting, *310
  Stark-Lyman, reconstructed, n 31
  steel, construction record, *404
   framework, failure, *507
  tenant, court and yard, size determined, *614
Building code, New York, 443
  slab formulas change, 759
Bunnell, S. H.:
  Education for professional success, *688
Burgess, P.:
  Standard apparatus and procedure recommended, abs. 644
Business, organization, public affairs, e 791
  public attitude towards, e 701

C

Cableway, drag-line, 716, *742
Cacheuta, Argentina, hydroelectric plant, n 233
Caisson, patent decision, United States Supreme Court, n 787
Calaveras dam, California, *226, n 247
California, road, n 180
   construction, costs, 233
  state highways, bond issue, 602
  storm damage, prevention, 281
  Bridge & Construction Co., contract, 332
  Highway Commission, road oil tests, *329
Campbellford, Lake Ontario & Western R.R., Trent River, bridge, construction, *44
Canadian Northern R.R., construction work completed, 215
  Pacific R.R., engineer corps for war service, 382
  Roger's Pass, tunneling record, e 189
Canal, deterioration, prevention, e 637
  development, e 637
  gate, design, Portland Canal, *794
  Illinois, 727
  irrigation, trestle replaced, *525
Car, dumping plant, Erie Railroad, *49
  overhang on curve, e 340
  testing, *729
Carlisle, J. N.:
  resigns as Commissioner of Highways, N. Y., e 189
Carr, O. E.:
  Underground survey of Cincinnati, *38
Carroll, A. W.:
  Electrically operated contractor's plant for building Kensico dam, *18, e 150
Case, M. B.:
  Substructure for new Memphis bridge, *518
Case School of Applied Science, study of cracks in pavements, 314
Cash register case, U. S. Court of Appeals, decision, e 349
Catskill aqueduct, Cornwall, N. Y., new tunnel, *514
  gate-valve, *181
  nearing completion, e 511
Causeway, New Philadelphia, Ohio, *78
Cedar Rapids, hydraulic turbine, *154
  River dam, Seattle, *656
   seepage, n 91
   loss, *656
   prevention, 631
  River reservoir, seepage, 62
Cement, autoclave test, U. S. Bureau of Standards, e 637, 655
  bags, shaking recovers cement, 815
  cost at Constantinople, n 709
  handling, bulk, e 285, *309
  hydration, 322, e 406
  manufacturing, costs, e 783
  Portland, hydration, n 174
   production, 44
  testing fineness with air analyzer, 737
  weight per sack, discussion, e 2
  industry, e 350
  plant, Katni, India, completed, n 398
Channel, river, control, Mississippi River, 42, e 35
Chapman, C. M.:
  Economic Side of Sand Testing, e 732, *734, *771, e 791, *801, l 813, n 821
Chattanooga, Tenn., bridge, wood, arch, construction, *142
Chehalis River, bridge, construction, *17
Chesapeake and Ohio Northern Railway, Sciotoville bridge, e 793, *799
Chester, Pa., bridge, reinforced-concrete, 164
Chicago, Commission on Ventilation, report, e 542
  Civil Service Commission, new administration, e 606
  engineer, municipal official, e 541
  Fire Department, hydrant, tests, *483
  Fire Limit Commission appointed, 216
  freight terminal, problem solved, n 819
  garbage disposal, analysis, *84
  garbage plant, operating costs, *230
  gas main, laying, *182
  motor truck ordinance, 727
  municipal engineers, pay, n 596
  pier, municipal, construction, *778
  sanitary district, water power development, protest against abuse of engineers, 184
  sewer, intercepting, work to begin, n 820
  stock yards, sewage, *266
  typhoid death rate, 329
  underground utility galleries, *53
  water filtration and sewage disposal, *709
  water, measurement, e 761
Chicago & Alton railroad shops, Bloomington, Ill., *487
Chicago & North Western R.R., bridge, substructure design, Pekin, Ill., *425
  Milwaukee bridge replaced, *462
Chicago & Western Indiana R.R., bridge, repair, *337
Chicago, Milwaukee & St. Paul Railway, electrification, *767
  grade crossing eliminated, *722

*, illustrated articles; l, letters to the editor; e, editorials; n, news of the week and filler notes.

- Chicago, Milwaukee & St. Paul Railway: (Continued)
  - Snoqualmie tunnel, *193
  - terminal, Spokane, Wash., *234
  - Trent Avenue subway, *234
- Chicago, Rock Island & Pacific Railway, track elevation, labor, costs, *785
- Chicago, West Ridge sewer, construction, *245
- Chicago Railway Terminal Commission, report, 758
- Chicago River, bridge, construction, *611
- Chimney wrecking, 564
- Chittenden, Vt., hydroelectric plant, *652
- Chlorine, liquid, water filtration, 338
- Christian, E. S.:
  - Only creosote properly applied withstands teredo, abs. *209
- Church, J. E., Jr.:
  - Snow survey provides basis for close forecast of watershed's yield, *494
- Chute, water, operation, *456
- Cincinnati, O., filtration plant, reconstruction, costs, *581
  - sewage treatment plant, construction, costs, *38
  - water main, failure, longitudinal compression, e 573, *588
- City manager, problems, 169
- Clark, N. W.:
  - Sewage aeration at Lawrence and Manchester compared, 367
- Clay, weight, tests, *330
- Cleveland, O., building, tenant court and yard, size determined, *614
  - Detroit-Superior bridge, concrete arch forms fall, *798
  - sewage treatment, abs. 422
- Coal, Alaska, free, n 118
  - deterioration, e 159
  - handling, telphers, *615
  - United States navy, replaced by fuel oil, e 66
  - utilization, e 159
- Coal dust, explosion, 41
- Coaling station, operation, Elmore, W. Va., *22
- Coast protection, bulkhead, New Jersey, *547
- Cobb's Hill reservoir, water level gauge, n 558
  - gauge glass, n 615
- Cofferdam, bridge, foundation, *534
  - pier construction, New York City, *654
- Cohoes, N. Y., hydroelectric plant, *352, e 349, *395 e 386
  - transmission towers, design, *677
- Cole, D. W.:
  - Concrete chute drops water 130 feet from canal to reservoir, *456
- Colorado, road improvement, *230
- Colorado River, irrigates Imperial Valley, 788
- Columbus, O., lawn sprinkling, 307
  - sewage plant, statistics, 492
  - water consumption, n 561
  - filtration plant, *576, e 575
  - water-supply, bacteria, n 655
- Column, clamp, concrete, *564
  - concrete, construction, *470
    - damage by fire, *241, e 219, n 248
    - reinforced, l 339
      - design, formulæ, 401
      - tests, *527
  - Edison fire, cause of failure, *150
  - metal, compression formula, e 416
  - restoring, reinforced concrete, l *150
  - spacing, factory building, *177
  - steel, railroad, elevated, New York City, *781
    - tests, 136
    - tests, Bureau of Standards, *549, e 574
  - steel and wood, design, Port of Seattle Commission, *233
  - tests, *527
  - wooden, weakened by bolt holes, n 125a
- Commerce, foreign, New York harbor, n 463
- Commissions, industrial relation, e 95
- Concrete, block, floor for sewage filter, abs. *333
  - test, 236
  - chuted, quality improved, 502
    - cold weather, *59, *275
    - columns, *470
  - cracks in, *160
  - development of use, 11, e 219
  - distribution, Fallsway viaduct, Baltimore, *544
  - effect of heat, *184
  - effect of sea water, *160
  - failure, e 189
  - frozen, cause of building collapse, *271
  - fused, Edison fire, *240, e 219, n 248
  - handling, automobile truck, *469
    - bucket on carriage, *408
    - for road building, Oregon, *295
    - on buildings, *309, e 285
    - operation, abs. *298
    - record made, Balboa Pier, Panama, 502
  - lime, India and Burma, 797
  - materials, rattler tests, 390
  - mixer, cost, *693
    - operation, Kensico dam, 199, 213
    - paving, distributing spout, *205
- Concrete: (Continued)
  - mixing, 556, e 542
    - costs reduced, *816
    - floating plant, *89
    - railroad cars, 59
  - placing pneumatic, *229, *246
    - record, 199, 213
    - world's record, l 276
  - plant design, Oregon, *295
  - preventing weathering, costs, 486
  - reinforced, adaptability, abs. 394
    - bridge unit system, *172
    - development of use, 11
    - formulas N. Y. code, e 702
  - shrinkage in curing, *489
  - 6 and 8-in aggregate, 556, e 542
  - slab, bridge, tests, *26
    - design, *170, e 244
    - girderless, l 180
  - study with microscope, *98, *160, *194, *263, *301, *320, e 96, e157, e 219, e 285, l 244, l 406
  - testing, *160
  - testing temperature, *710, e 732
  - tests, slag and trap-rock, 405
  - warming, with electric car heater, n 182
- Concrete Institute, Committee on Edison fire, n 31
- Concrete number of Engineering Record, e 157
- Condensation, housing of hydraulic turbine, power house, *194
- Conduit, concrete, reinforcement construction, 629
  - protected by worm gear valve, *531
  - reinforced concrete, arched, formula, *648, l 753
- Conklin, C. D., Jr.:
  - Nomographic charts for simple beam design, *809
- Connaught bridge, Vancouver, B. C., fire damage, *633
- Connecticut, Health board, sewage control, n 472
- Connecticut Society of Civil Engineers, membership interest promoted, e 792
- Connell, W. H.:
  - Economy in highway work the aim of Philadelphia's new unit cost system, 360
- Connell, W. H.:
  - Wooden smoke-sheathing, Abs., n 767
- Conservation law, Ohio, e 731
- Construction, beam design, formula, *809
  - costs reduced, advance planning, 565
  - Method, formula, *807
  - Time study, 341
- Construction plant, light traveler, *277, *439
- Contract, changes, e 351
  - damage recovered, boring records, misleading, 554, e 541
  - decision, Washington State Supreme Court, 345
  - road, *174
  - site change, California Bridge & Construction Co., 332
  - time extension, 435, 463
  - war and engineering, e 128
- Contract work, inspection tyranny, e 447
  - organization needed, e 792
  - workmen, selection, 501
- Contractor, camp boarding-house management, 662
  - cost sheet keeping, *535
  - field office, *816
  - not a gambler, e 512
  - point of view, 15
  - status, e 671
  - superintending method, changing, e 605
- Cooley, L. E., dismissal, e 541
- Cooper, H. L.:
  - Development of water power on public lands, abs. *75
- Cornwall, N. Y., Catskill aqueduct, Moodna tunnel, *514
- Corrosion, cause by smoke, prevention, n 767
  - iron and steel, prevention, 392
- Corthell, E. L.:
  - Methods of creating and maintaining channels at mouths of fluvial and tidal rivers, 42, e 35
- Cost data, publicity, 516
- Cost keeping, records for the contractor, *535
- Cotten, S. M.:
  - Reinforced-concrete highway trestle, *54
- Cotton, handling, New Orleans, *402, e 385
- Cougha Poort, South Africa, irrigation, n 593
- Crane, locomotive, for unloading car of dirt, *28
  - sand, handling, *60
- Creosote, coal-tar, mixtures, l 150
  - wood preservation, 398
- Creosote plant, management, 145
  - production increased, America, n 646
  - protect piles against teredo, abs. *209
  - specifications, 144
  - tests, 144
- Cresson, B. F., Jr.:
  - New design proposed to protect points on New Jersey shore from the sea, Abs., *547
- Crib, reinforced-concrete, Welland ship canal, *458
- Cross hairs, adhesive, l 533
- Crystal Springs dam, California, *226
- Culebra Cut, now Gaillard Cut, n 571
  - survey, daily, safety, n 91
- Culvert, corrugated pipe successful, *558
- Cumberland, Md., waterworks, construction, *137
- Cumberland Valley R. R., bridge, Harrisburg, Pa., *326
  - safety record, 103
- Curb, concrete, *309
- Curve, circular, computing offsets, l 307

## D

- Dalston, C. F.:
  - Substructure conditions fix design of Chicago & North Western bridge at Pekin, *425
- Dalstrom, O. F.:
  - See Dalston, C. F.
- Dam, Austin, Texas, reinforced concrete, *672, e 669, *707, *750
  - Calaveras, *226, n 247
  - Cedar River, seepage, n 91
  - concrete, construction, 199, 213
  - construction, *175, 202
    - Euphrates River, *24
    - West Fork waterworks, *147
  - Crystal Spring, California, *226, n 247
  - electric power, operating costs, Kensico dam, *18, e 2
  - Elephant Butte, N. Mex., 274
  - failure, Lyman dam, Arizona, *537
  - Fort Worth, West Fork Waterworks, l 307
  - green concrete, uninjured by flood, Los Angeles, *775
  - Government, concrete mixing plant, operation, *89
  - ice thrust prevention, 800
  - safety factor, l 437
- Davis, H. A.:
  - Bureau of Standards on the autoclave test, 655, e 637
- Dayton, Ohio, flood prevention, e 286
- Decatur, Ill., sewage plant installed, *495
  - sewage treatment, 775
- Delaware, Lackawanna & Western R. R., bridge, reinforced concrete, *172
  - Buffalo terminal, *334
- Denver, typhoid death rate, 403
  - water consumption, n 675
- Derrick, anchored to truck, n *501
  - car made from steam shovel, *815
  - light traveling, *439
- Detroit, Michigan Central R. R., yard extension, 422
  - pumping station, costs, 116
  - transportation needs, 427, e 416
- Detroit-Superior bridge, Cleveland, concrete arch falls, *798
- Diamant, S.:
  - Facilitating timber design, *296
  - Suspended beam forms—their advantages and disadvantages, *120
- Diesel engine, on contract work, l 500
  - torpedo-boat destroyer, Japan, n 21
  - use in construction plant, *409, e 386, l 660
- Dirt, street, weight, n 87
- Ditch, drainage, construction, 725
- Dock, concrete, rat proof, New Orleans, 325
- Dodge, G. M., American Society of Civil Engineers, honorary member, elected, 442
- Dortmund tank, tests, *266
- Drain, storm-water, Indianapolis, *560
- Drainage, plant, Arkansas operation, *41
- Dredge, dipper, rigged as drag, *119
  - operation, *41
- Dredging, drag-line, *214
- Drill, diamond, drives boat, *439
  - rock, *725
- Drilling, rock, Sun River, Montana, *341
- Drills and drilling, jack-hammer, operating costs, 90, *278
- Drum claims, Norcross patents, n 787
- Drydock, Pearl Harbor, construction, l 57, e 65, *82
  - wrecked, Victoria, B. C., 247
- Dry rot, timber, 366, e 317, 400
- Du Bois, Pa., reinforced concrete roundhouse, *167, *290
- Duluth, paving, day labor, costs, 333
- Dump-bucket, used as grab bucket, *815
- Durham, H. W.:
  - Limits Manhattan pavements to three standard types, Abs., 202
  - Municipal plant reduces asphalt maintenance cost in New York, Abs., *238
  - Value of paving materials disclosed by two years' service test in New York, Abs., 203
- Duty, export, lumber, United States to Australia, 21
- Dynamite, safety, precautions, n 786

## E

- Eadington, T.:
  - System in managing camp boarding-house pays contractor, 662

*, illustrated articles; l, letters to the editor; e, editorials; n, news of the week and filler notes.

Earl, G. G.:
  Consolidation of country's waterworks association urged at American convention, Abs., 643
Eastman, F. H.:
  Construction of Cumberland waterworks, *137
Eastwood, S. K.:
  Concrete mixer serves as a hoisting engine for excavated earth, 120
Eaton, G. A.:
  Pointers on trestle building with easily moved pile-driver, *501
Eccentric riveted connections, l 276
Eckert, Otto E.:
  Frozen concrete responsible for building collapse, *271
Eddy, H. T.:
  Concrete-steel construction, Part I, Buildings, 56
Edgerton, G. E.:
  Alaska's road and bridge-builders face snow, frozen ground and glacial floods, *764, e 761
Edison fire, l 88, *184, n 248
  Committee, n 31
  effect on building, e 37
  girder repairs, n *524
  National Board of Underwriters, report, *239, e 219
Edison plant, buildings restored, *40, *72, l 627.
  repairs, *503, e 477
Education, engineering, e 287
  experiment, e 478
  English for engineers, e 763
  life vs school, e 762
  vocational training, Wisconsin, e 512
Electrification, costs, New York, New Haven & Hartford R. R., 178
Electrolysis, reinforcing rods, prevention, tests, 465
Elephant Butte dam, New Mexico, 274
Elevator, traveling, use in building construction, *755
Eliot, W. M.:
  Nomographic solutions for formulas of various types, Abs., *807
Ellms, J. W.:
  Brass screen between sand and gravel eliminated in Cincinnati filter reconstruction, *581
Elmore, W. Va., coaling station, Virginia Railway, *22
Embankment, replaces wooden trestle, *525
  sod support, 629
Emerson, H.:
  Justifiable expenditure for tie treatment, 106
Employers bill of rights, e 158
Emscher tank, see Imhoff tank
Engineer, advertising, l 660
  Belgian Relief Commission, *538, e 511.
  city adviser, e 35
  civil government corps., e 669
  college training, value on construction work, e 190
  commission, e 415
  compensation, *139, e 129
  co-operation movement, 766, e 762
  co-operation with chamber of commerce, e 253
  cost data, publicity, 516
  displacement of consulting, e 255, 279, 280
  education, e 97, n 274, * 688, e 703, * 722
    A. S. C. E. committee, e 287
    Spanish, e 733
  licensing, 757
    Illinois, passed House, n 787
  loss to profession, Lusitania sinking, *631
  military reserve corps, 472
  military training, e 445
  minimum charges, n 250
  municipal, education, e 96
  municipal official, 541
  national defence, e 639
  natural ability, l 627
  preparatory school education, e 191
  promotion, examinations, 715
  protest against abuse, Chicago, 184
  public recognition, Abs., 261, e 255
  public speaking, l 339
    ability, e 637, l 752
  publicity, 718
    national movement, 666
  recommendations made to New York Constitutional convention, 561, e 543
  relation of society to student, e 763
  reunions, e 253
  salaries not proportionate to training, 695, l 753
  salary, l 438
  sanitation, new fields, e 703
  service in war, e 763
  status, e 2, e 65, e 254, e 255, Abs., 261, 361, 390, l 468, n 804
    A. I. E. E. meeting, 248
  study of English, e 763
  student member, Engineers' Club of St. Louis, 30
  supervising, abolished on United States Reclamation Service, n 787
  training in public speaking, e 190
  war service, Canadian Pacific Railway, 382
  war services corps, A. S. C. E., 663
Engineer and campaign collections, e 445
Engineers' Club of St. Louis, Student member, 30
Engineering, achievements, 1915, e 3
  civil, Panama-Pacific Exposition, 619
  contracting, Panama-Pacific Exposition, 619
  education, committee work of National Societies, 697
  knowledge, classifying, 696, e 669
  profession, e 1
    war losses, e 605
  relation of society to student, e 763
  relation to war, e 670
  rural, e 65
  state, departmental control, e 703
  structural steel, development, 7, e 35, l 57
  war problems, e 95
  water-power, e 445, l 467
Engineering Foundation, n 92, e 157
  Board named, 695
  Gift, *153
Engineering profession, public recognition, e 189
Engineering Record, "Hints for the Contractor," e 1
  News Section, e 1
Engineering societies, committee work, e 36
  Philadelphia, plan consolidation, n 32
Erie Railroad, car-dumping plant, *49
Estaca Mining Co., Mexico, waterwheel, *198
Everglades Engineering Commission, canal, n 411
Excavating machinery, 176
  operating costs, *182
  operation, sewer, Vancouver, B. C., 20
Excavation, costs, trench, *182
  ditch, sewer, costs, 278
  drag-line machine, moved on plank track, *152
  earth, building, costs, *68
    canal, *146, n 411
    concrete mixer used as hoisting engine, 120
    drag line, *119
    drainage, Arkansas, *41
    flood prevention, 429
      costs, 176
    reservoir, drag line, *27
    sewer, costs, 20
    sewer, West Ridge, Chicago, *245
    with locomotive crane, *28
  quicksand, 277
Explosion, coal dust, 41
  sewer, Pittsburgh, n 249

F

Fallsway, viaduct, Baltimore, construction, *544
  traveler, *277
Farwell, C. A.:
  Tour of West discloses best practice in irrigation and power canal design, 23
Fence posts, reinforced-concrete, 451
Fender, pier, suspended, San Francisco, *233
Ferry, aerial, vehicle, *43
  railroad, Southern Pacific Company, n 58
Fetherston, J. T.:
  Incinerator plant guarantee too strict for fulfilment, l 813
  Methods introduced in New York last winter cut cost and increased speed of snow removal, *640, e 637
Filing, magazines, e 57
Filter, efficiency, Louisville, n 767
  reconstruction, brass screen eliminated, *581
  sand, source and preparation, n 493
  water, liquid chlorine, abs. 338
Filtration plant, construction, Baltimore, *583
  costs, Philadelphia, *59, e 573, l 659
  downspouts, e 253
  dry feed apparatus, *586
  pumping equipment, Akron, Ohio, *580
  St. Louis, largest in world opened, n 537
  Wheeling, W. Va., political decisions, e 606
Finance, Pan-American financial conference, e 670
Fire law, violation, individual responsible, Pennsylvania, 631, e 669
Fire limit commission, Chicago, appointed, 216
Fire prevention, progress, e 670
  punishment for negligence, New York City, e 416
Fire Protection Association, convention, 667
Fire resistance, concrete defended, 598
Fire service system, high pressure, Cincinnati, *590
Fitchburg, Mass., sewage, plant, costs, 427
  sewage, tank, abs. *332
Fletcher, W. G.:
  Truck used as deadman, *501
Flood prevention, Arkansas, *41
  Colorado, Imperial Valley, 600
  costs, 176
  Dayton, Ohio, e 286
  Indiana, 169
  Indianapolis, n 250
  Los Angeles, n 31
  Miami, conservancy act, Supreme Court considers, n 280
  Miami district, Ohio, 186
  Mississippi river, 429, 522
Flood prevention: (Continued)
  Ohio, 29, e 541, e 571
    conservancy act, n 250
      law, 346
      work begins, n 787
  Pennsylvania, *109
  Sacramento river valley, *227
Floor, concrete, dust prevention, 294
  design, *748
  factory, *177
  form, failure, Ford building, *247
  plank, failure, 300
  tile tests, *432
  wood block, for steel bridge, costs, 300
Florida, brick roads, *452
  road, sand-asphalt used, *622, e 670
Fly, aiding by filth, e 511
Foote, C. E.:
  Misuse of a good paving material is detrimental to Florida road development, *452
  Sand-asphalt may solve Florida road problem, *622, e 670
Ford building, Fargo, N. D., floor form failure, *247
Forest, California, n 389
  firebreak, Minnesota, 780
Forest fires, national, east, 407
  United States, 305
Forest products federation, e 286
Formula, solving, nomographic chart, *807
Fort Worth, Texas, waterworks, e 307
Foundation, sawdust, Muscatine, Iowa, *496
Fox, H. H.:
  Half-mile concrete viaduct provides double deck trafficway in Kansas City, *164
Frank, L. C.:
  Co-operation sought in conducting activated sludge experiments at Baltimore, *521, e 511
  English experiments on sewage aeration reviewed as preliminary to Baltimore tests, *288, e 285
Franks, C. D.:
  Kinks in road construction, abs. 197
Fredonia, Kansas, pavement, concrete, costs, *530
Freight, handling, automobile, truck, 52
    electric truck, costs, *403
    St. Marys Falls canal, 453
Freight, terminal, Chicago, problem solved, n 819
  river traffic, e 318
Fry, A. S.:
  Scraper dragged from extension boom cleans berm of ditch, 725
Full crew law, New Jersey, e 385
Fuller, G. W.:
  Advances in sewage disposal, 10

G

Gaillard cut, new name for Culebra, 571
Galligan, W. J.:
  Summer municipal wastes, *84
Garbage, collection, automobile truck, Los Angeles, 394
Garbage disposal, analysis, Chicago, *84
  New York City, 442
    odor elimination, e 793
  San Francisco, *224
  San Francisco and Atlanta cases, 777, e 761, l. 813
Garbage disposal plant, Akron, Ohio, *63
Garbage disposal plant, Chicago, operating costs, *230
Garbage disposal plant, operating costs, *225
Gas main, welding, *182
Gasoline, in sewer, tests, 457
Gate, automatic, water regulating, *304
  cylinder, tests, hydraulic turbine, *485, *690
Gate-valve. See Valve, gate
Gausmann, S.:
  Suggestions for concreting street railway track, 535
  track concreting costs vary with mixing methods, *451
Gila river, ferry, aerial, *43
Glaser, J.:
  Short subway section in New York involves many difficulties of design, *448
Goethals, G. W., honorary member of Institute of Civil Engineers, n 571
Gondola cars, permanent runways, reduce concrete mixing costs, *816
Good roads year book, n 23
Gorgas, W. C., typhus relief expedition and service, n *508
Government dam, Ohio river, concrete mixing plant, *89
Grade-crossing, bridge, cost, *770, e 761
  elimination, *234, e 319, *327
Grade-crossing law, discussion by chief engineers, 455, *674
Gradenwitz, A.:
  Telphers expedite coal movement at German plant, *615
Grading, estimating, formula, 610

*, illustrated articles; l, letters to the editor; e, editorials; n, news of the week and filler notes.

Graham, D. A.:
  levels, abs. 204
  Well pump inefficiencies due to varying water
Granite, protest against use between car tracks, Kansas City, n 508
Gravel, unloading plant, floating, *60
Great Britain, royal commission, sewage treatment, e 478
Great Falls, Mont., hydraulic turbines for power company, *183
Great Falls terminal line, electrification, *767
Greeley, S. A.:
  Reject untried sewage treatment methods for Decatur, abs. 775
Greenlaw, R. W.:
  Twenty-ton valve lowered down 250-foot shaft in 20 min., *181
Gregory, J. H.:
  Multiple flow chambers in Imhoff tanks, *433
Grouting boxes, Georgia road, *342

H

Hagar, E. M., resigns as president of Universal Portland Cement Co., *215, e 191
Hagar Portland Cement Company, receives charter, n 787
Hammer, steam, for driving wood sheeting, *245
Hammond, H. D.:
  Diesel engine for the contractor, *409, e 386, l 660
  greater care in employing workmen will pay the contractor, 501
Hammond, L. M.:
  Preliminary estimating of canal excavation, *146
Harbor, improvement, San Francisco, *225
Harding, H. McL.:
  Beaumont water terminal will be built in units, *721
Hardman, R. C.:
  Nothing heavier than two-by-four used for tall pier forms, *726
Harecastle canal tunnel, England, *234
Harlem river, bridge, placing new span, *341
Harlem river section, New York City, subway, construction, *616
Harris, F. S. M.:
  Tower of jewels at Exposition a 435-foot skyscraper on two-hinged arches, *112
Harrisburg, Pa., bridge, concrete, *326
Hartwell, D. A.:
  Cement gun used on Imhoff baffles at Fitchburg, 502
  Factors in design of Imhoff tanks at Fitchburg, abs. *332
Haskell, A. C.:
  Superintendents can save money by short time studies, 341
Hatt, W. K.:
  Indiana's flood problems outlined, abs. 169
Hatton, T. C.:
  Protecting Milwaukee's water supply, abs. n 559
Haulage, electric, Harecastle canal tunnel, England, *234
Hay, W. M.:
  Concrete rings, superimposed, sunk to form San Antonio pump pit, *741
Hazen, A.:
  Progress in water supply, 5
Health, statistics, n 77
Health department, publicity, e 254
Heater, electric car, used for warming concrete, n 182
Hell Gate bridge, construction, *568
Henderson, C. E.:
  Guys steady high steel tower during moving, 410
Hendrick, C. W.:
  Co-operation sought in conducting activated sludge experiments at Baltimore, *521, e 511
Hetch Hetchy, dam, construction, *226
  water supply, e 446
Hill, N. S., Jr., American Waterworks Association president, *635
Hillberg, A. G.:
  Central hydroelectric plant of 50,000 horsepower replaces inefficient separate units at Cohoes, Pt. I., *352, e 349, *395, e 386
  Cylinder gates increase turbine efficiency, *485, *690
Hiller, J. A.:
  Cincinnati builds high pressure fire service system, *590
Hinchliff, G. E.:
  Build first floor on form work before pouring basement walls, 694
Hindia dam, Euphrates river, *24
Hoist, one drum, without derrick, *120
  steam-driven, two speeds, 205
Holbrook, E.:
  Some actual railroad contingencies and what they cost, abs. 774
Hollingsworth, C. H.:
  Collapsed tunnel shield at Memphis rebuilt in bad ground, *388
Holmes, G. A.:
  Investigations of explosibility of coal dust, abs. 41
Holtwood plant, Pennsylvania Water & Power Co., single-runner turbine, efficiency test, *365, *358, e 349
Honolulu, road building, e 158
Hoover, C. B.:
  Low river flow exacting for Columbus sewage works, abs. 492
Hoovey, C. P.:
  Columbus waterworks makes its own alum—a revolutionary step in water purification practice, *576, e 575
Horrocks, H. E.:
  Protest against condemnation of treated Douglas fir, 106
Horton, R. E.:
  Economic considerations justify wood-stave pipe for waterpower penstock, *356
House, moving, Chicago, *694
Housing, fire protection, 667
Housing problem, health, e 607
Howell, W. A.:
  Pavement troubles along car tracks eliminated, 116
Hoxie, F. J.:
  Treated timber for factory construction, 107
Huber, H. G.:
  Covering protects large penstocks from freezing, *269
Hunt, G. M.:
  Temperature changes in wood under treatment, 144
Hyde, C. G.:
  Multiple flowing-through chambers in Imhoff tanks, abs. 72
Hydrant, tests, Chicago fire department, *483
Hydraulicking, slotted pipe, *534
Hydroelectric bill, Federal failure, e 317
Hydroelectric development, 6
  public land, *75
  tail-tunnel, 380, e 350
Hydroelectric number of Engineering Record, e 349
Hydroelectric plant, Cacheuta, Argentina, n 233
  Chittenden, Vt., *652
  Cohoes, N. Y., *352, e 349, *395, e 386
  design, 467
  energy, New England, n 613
  Milledgeville, Ga., *372
  Seattle, penstock breaks, *471
    reservoir, leakage, 508
  Tallulah Falls, Ga., *378
  Tennessee Eastern Electric Co., *175, 202
  transmission towers analyzed, Cohoes, *677
  units, largest in world, 377, l 533
  Waucoma, Iowa, *453
Hypochlorite, water supply, Milwaukee, n 658

I

Ice-house, Lake Hopatcong, construction, *50
Illinois, architects, licensing, e 190
  Board of Health, engineering staff, recommended, abs. 185
  public works, single department recommended, 758
  Univ., civil engineering department, F. H. Newell, head, *599
Imhoff tanks, baffles, cement gum used, 502
  chamber, flowing-through, 72
  Decatur, Ill., *495
  Fitchburg, Mass., abs. *332
  irrigation, odor elimination, *748
  multiple flow chambers, *433
  Rochester, N. Y., *679
  tests, *266
Imperial Valley, Col., flood prevention, 600
  irrigation, Colorado river, sufficient, 788
Indiana Sanitary and Water Supply Association, water supply discussion, 313
Indianapolis, Ind., pumping station, 208
  storm water drains, *560
Indianapolis flood-prevention bill, amendment, n 250
Indo-China, water hyacinth, utility, n 692
Influence line, time savers, use, *517
Interborough and Brooklyn Rapid Transit lines, new East River tubes started, *810
Interborough Rapid Transit Co., safety record, e 180
Interstate Commerce Commission, anti-trust decision, e 637
  land valuation, 424
  railroad, reform, e 1
  railroad statistics, *453
  valuation, 622
  valuation conference, e 701
  valuation division, 324
Iowa-State Engineering Society, opposes service bureau, 279
Iowa Technical Service Bureau, opposed, 279
Iron, ore production, 102
  pig, production, United States, 429
  wash water salvage, 675
Iron and steel, structural shapes production, n 737
Iron in water, n 526
Irrigation, aqueduct, Los Angeles, n 31
  data, 674
  development, 13
  extent, Wyoming, n 647
  Imperial Valley, Colorado river, ample, 788
  Philippines, bamboo waterwheel, e *814
  Texas, direct-explosion pump used, *596
Irrigation and power canal, design, practice, 623
Ithaca, N. Y., filtration plant, *586

J

Jack, hydraulic, n 693
James, E. W.:
  Maintenance cost system on U. S. experimental road, *418, e 415
Jennings, C. A.:
  Liquid chlorine reduces cost at Bubbly Creek filters, abs. 338
Jensen, J. N.:
  Economic design of concrete slabs, *170
Jitney bus. See Automobile, "Jitney" bus
Johnson, Nathan C.:
  Economic side of sand testing, *734, e 732, *771, e 791, *801, l 813, n 821
  Use of microscope in the study of concrete, *98, *160, *194, *253, *301, *320, e 96, e 157, e 219, e 285, e 318, l 244, l 406
Johnson, R. D.:
  Tail-tunnel regulation suggests new opportunities in hydroelectric field, 380, e 350, l 627
Johnson, R. P.:
  Large reinforced-concrete crib used for Welland ship canal entrance, *458
Johnson grass, poison, e 784
Johnston, H. F.:
  Special hardie cuts 20-inch steel pipe quickly, *469
Joint, concrete, pavement, abs. 198
  expansion, water pipe, 197
  steel and concrete, rust-proof, n 630
Jones, C. E.:
  Wood cofferdam with bottoms sunk for bridge in swamp, *534
Jones-Talbot rattler, tests, 390
Jonson, E.:
  Shear in beams, *25
Journalism, college, e 702

K

Kammerer, A. L.:
  Specification for a coal tar-creosote solution, 144
Kansas City, Mo., brick pavement, 546
  broken concrete as aggregiate, *816
  creosoted block, tests, 86
  Twelfth street viaduct, *164
Kansas City street commission, protest against use of granite between car tracks, n 508
Kaufman, M. L.:
  Pipe connecting meters to main jetted under expensive pavement, 630
Kaw River, Kansas City, bridge, *213
Keaton, E. O.:
  Use of six-inch and eight-inch aggregate points to economies in concrete work, 556, e 542
Kensico dam, contractor's plant, electric power, *18, e 2
Kensico dam, Walhalla, N. Y., construction, 199, 213
King, C. L.:
  Training for the municipal service in Germany, abs. e 96
King, W. B.:
  Change of site does not affect contract, 332
  Contract time limit binding despite excessive quantities, 463
  Failure to act on application for extension of time, 435
King, W. R.:
  National "Factor of Safety," *133, l 339, e 127, l 244

L

Labor, agencies, e 702
  day, paving, costs, 333
  England, shortage due to war, e 447
  law, public works, e 287, 443
Lake Hopatcong, ice house, *50
Lauchli, E.:
  Tests check computed values of surges, *378

*, illustrated articles; l, letters to the editor; e, editorials; n, news of the week and filler notes.

Law, fire prevention, Pennsylvania, 631, e 669
  immigration and contracting, e 95
  registration, N. Y., architects, 743, 706
Lawn sprinkling regulation, Columbus, Ohio, 307
Lead wool, calking flexible-joint, pipe line, tests, n 85
Lederer, A. W.:
  Methylene test unreliable with colloid-bearing waters, abs. 102
Lee, E. H.:
  Motor trucks and trailers in freight houses, 52
  Railroads need protection as well as regulation, 121
Letton, H. P.:
  Concrete a plague-eradicator in New Orleans, 325
Levee, construction, hydraulic fill, *534
    Mississippi river, 522
    Sacramento river valley, *227
  costs, Sacramento river valley, *228
  Mississippi river, seepage elimination, *552
Leveling, U. S. Coast and Geodetic survey, record, Abs. 807
Leveling machine, road, Ohio, *209
Library, engineering, co-operation, e 351, l 438
Licensing, architects, Illinois, e 190, n 124, 696
  criticisms by architects, e 387
  engineer, 757
    Illinois passed House, n 787
  report by licensed architect criticised, l 533
  structural engineers, Illinois, n 413
Lime, hydrated, use in concrete, abs. 379
Lincoln Highway Association, 274
Lincoln Memorial, marble column, size, n 619
Linseed oil, use on concrete floors, 294
Literature, technical, National Societies, classification, 696, e 669
Little river, drainage project, 429, n 611
Loam, weight, tests, *330
Lockett, A. M.:
  How not to waste steam in creosoting plants, 145
Locomotive, electric, Panama canal, touring, *134, e 127
  gasoline, road, construction, *152
Longley, F. F.:
  Variations in practice disclosed by water sterilization statistics, abs. *291
Los Angeles, aqueduct, irrigation, n 31
  aqueduct suit, decision, 441
  automobile, jitney bus, e 513
  dam, construction, uninjured by flood, *775
  flood prevention, n 31
  sewer, assessment, n 91
  water supply, 759
Louisville, Ky., Portland canal, seepage, prevention, 785
  entrance, single lift lock, *794
  water supply, bacteria, n 796
Louisville & Portland canal, public waterway, n 470
Lowe, H.:
  Some factors in painting structural steel, abs. 428
Loweth, C. F.:
  Railroads from the engineering point of view, 4
Lumber, trade, e 286
  use in U. S. promoted, 313
Lumber mattress, bank protection, l 276
Lusitania, American engineers lost, *631

## M

McCormick, E. B.:
  Importance of grades increases with betterment of road, abs. 265
McCullough, C. B.:
  Iowa State highway bridges not too heavy, abs. 138
McDaniel, A. B.:
  Method of excavation for buildings, *68
MacDonald, J. A.:
  Lake traverses on railroad preliminary work, 48
MacDonald, W. B.:
  Drill boat lifts itself out of the water to escape waves, *756
McGeady, P. A.:
  Column forms hold thirty feet of wet concrete, *470
McGraw Publishing Company, medal, Panama-Pacific Exposition, n 787
McMillan, F. R.:
  Shrinkage of concrete and conditions of curing, *489
Magee, C. L. C.:
  Graphic method of detailing hip-rafter connection, *562
Manchester, Eng., sewage, aeration, e 285, *288
Mandigo, C. R.:
  Cement-sand bed best for wood-block paving, 647
  Kansas City tries thin brick with sand-asphalt surface, 546
Map, New York City, official, *666
Map making, Interstate Commerce Commission, l 814
Marble, warped monument, l *468
Marburg, E.:
  Steel structural engineering, 7, e 35, l 57
Marran, V. P.:
  Practical procedure in designing penstocks, *355
Masonry, construction record, 119
Massachusetts, building law, 345
  roads, bituminous penetration, *608, e 605
  water-power, revision of laws governing control, n 216
  water resources, e 387
Massachusetts Highway Commission, year's work, l 533
Massachusetts Institute of Technology, buildings, floor design, *748
  instruction experiment, e 478
  Mathematical Laboratory, organized, n 138
  student training, e 191
Masterson, P. J.:
  Patching grouted brick pavements, 662
Mathematical Laboratory. See Massachusetts Institute of Technology
Mead, D. W.:
  Developments in the hydroelectric field in 1914, 6
Mears, Lieut.:
  First report of Alaskan railroad, n 817
Measuring box, sand and stone, n 90
Medal, Leonard C. Wason, n 248
Medicine Hat, Alberta, Can., trench excavation, *182
Mellon, M. P.:
  Rail support for ditching under railway line, *502
Memphis, Tenn., bridge, railroad substructure, *518
  tunnel, shield, rebuilt, *388
Merriman, M. S.:
  Elected president, American Society for Testing Materials, n 818
Meter, installation, Detroit, statistics, n 88
  water, n 431
    Omaha, 712
Mexican Central R. R., bridge, *181
Miami, Ohio, conservancy district, 186
Michigan Central Railroad, Detroit, yard expansion, 422
Microscope for concrete analysis, *98, *160, *194, *263, *301, *320, e 96, e 157, e 219, e 285, l 244, l 406
Mile Rock tunnel, San Francisco, *227
Milford turnpike, Conn., *480, e 477, n 562
Milledgeville, Ga., hydroelectric plant, *372
Miller, M.:
  Long-span roof slab of concrete and tile, *516
Miller, W. E.:
  Ashland water-rate decisions explained, *805
Milwaukee, railroad bridge, new span placed, *462
  water consumption, n 654
  water supply, hypochlorite, n 658
    protection, n 559
  waterworks, meter maintenance systematized, *587
Milwaukee, Northwestern-Mutual Life Insurance Building, construction, *205
Minetto, N. Y., water-power, n 344
Mining, hydraulic, blasting, cartridge, *28
Minnesota, forest, firebreak, 780
  Health Board, collapsible hypo plant, *373
Minnesota-Municipal League, engineers aid, 280
Mississippi County, Ark., District No. 9, flood prevention work, 176
Mississippi River, channel, control, 42, e 35
  levee, construction, *552
Mitler, H. E.:
  Rapid construction of additions to steel buildings, *404
Moccasin Creek, Cal., power station, *227
Mohlman, F. W.:
  Treat Illinois sewage with activated sludge, Abs., *421
Mold, steel, sand testing, *463
Mont D'Or, tunnel, e 731
Montgomery, C. B.:
  Keeping accurate daily and total cost sheets will pay the contractor, 535
Montgomery, C. M.:
  Sand testing at New York, 551
Mortar, strength, tests, *85
Mosquito, extermination, e 349
Mower, high speed, large weeds and brush, *119
Moyer, J. A.:
  Distribution of vertical soil pressures, *330
Münster-Grenchenberg Tunnel, Berne, Switzerland, n 71
Municipal engineering, San Francisco, *223
Municipal Engineers of the City of New York, boring record, e 1
Murray, S.:
  Chehalis River temporary bascule bridge, Abs., *17
Murray, W. S.:
  Railroad electrification, Abs. 178, Abs. 394
Muscatine, Iowa, foundation, sawdust, *496

## N

Nasmith, G. G.:
  Water filter of new type, tested at Toronto, employs drifting sand principle, *464
National Board of Fire Underwriters, report on Edison fire, *239, e 219, n 248
National defense, engineering, *133, l 339, e 127, l 244
National Fire Protection Association, report on Edison fire, *239, e 219, n 248
National Transcontinental Railway, Canada, bitter experience, e 478
National Waterworks Association, proposed, Abs. 643, e 638, 663
Navigation, obstruction, by hyacinth, Florida, n 526
Navy Yard building, contractors bid, n 31
Needle valve, see Valve, needle.
New Jersey, coast protection, bulkhead, *547
  Jersey City Marginal Railway, 632
New Orleans, cotton warehouse and terminal plant, *402, e 385
  Waterfront structure, eradicates plague, 325
New York, New Haven & Hartford R. R., electrification, 178
New York City, building code, revised, 443
  elevated railroad, steel construction, *86
  map, official, *666
  pavement, Abs. 202
    tests, 203
  railroad, elevated, improvement work, *781
  snow removal, *215, e 318, l 437
  Steinway and Fourth Avenue Brooklyn subway open, n 817
  subway, Brooklyn Bridge connection, *76
New York Connecting railroad, East River bridge, *399
New York Constitutional Convention, engineering recommendations, 561, e 543
New York harbor, foreign commerce, n 463
New York State Barge Canal, appropriation, n 471, n 568
  Health Department publicity, e 254
  reservoir construction, 247
  road material, survey, 488, e 477
New York State Building, Panama-Pacific Exposition, *296
New York State College of Forestry, Syracuse University, investigations, 364
New York State Constitution, engineers act, e 385
  recommend changes, n 345, 382
  revision, American Society of Civil Engineers, represented, n 92
Newell, F. H.:
  Broad movement for engineering co-operation, Abs., 766, e 762
  Head Civil Engineering department, University of Illinois, 599
  Progress in irrigation, 1914, 13
Niagara Falls, pavement, asphalt, costs, n 271
Nolachuckey River, Tenn., dam, Tennessee Eastern Electric Co., *175, 202
Nonographic chart, beam design, *809
  structural design, *807
Norfolk & Western Railroad, electric, *704
North Dakoto, engineers' schedule of minimum charges, n 250
Northern Pacific Railway, elimination of grade, Point Defiance line, *744
  Point Defiance tunnel, roof shield, *272, e 285
Northwestern-Mutual Life Insurance Building, Milwaukee, construction, *205
Norton, C. A.:
  Provision for traction stresses in Quebec bridge, 492, e 477
Noyes, A. H.: Seasoning of soft wood ties, 105

## O

Ogden, H. N.:
  Dry-feed apparatus solves Ithaca's coagulent problem, *586
Ohio, Board of Boiler Rules, American Society of Mechanical Engineers, code indorsed, n 471
  Conservancy Act, 29, n 250
    Supreme Court considers, n 280
  River, lock 41, Louisville, Ky., construction, *794
  road, between Alliance and Louisville, *209
Oil, pressure circulation, hydoelectric plants, e 387
  road, tests, *329
Omaha, water cost, 712
Ontario, Canada, sewerage, 299
Ontario Power Co., Niagara Falls, surge tank, *368
Oregon, road, durability, 326
  water-power tax abolished, 539
Oregon-Washington Railroad & Navigation Company, bridge, Chehalis River, construction, *17
  terminal, Spokane, Wash., *234
Ottawa, water supply, controversy, n 62
  water supply case, e 35, 156
Oxy-acetylene welding (See welding, oxy-acetylene)

*, illustrated articles; l, letters to the editor; e, editorials; n, news of the week and filler notes.

## P

- Paint for structural steel, Abs., 428
- Painting steel, for electrolysis prevention, 465
- Palmer, R. E.:
  - Angleiron converts steam roller into pavement cutter, *440
- Palmer, W. H.:
  - Outrigger on gin-pole saves time in erecting roof steel, *310
- Panama, Balboa Pier, concrete handling, 502
- Panama Canal, barge, concrete, *684
  - builders honored, 311
  - Culebra cut, pontoon railroad bridge, *270
    - slide, 345
    - survey, daily, safety, n 91
  - electric towing locomotives, *134, e 127
  - fuel oil supplied, n 468
  - Gatun name changed, l 659
  - model, Panama-Pacific Exposition, *434
  - name changing, e 701
  - rainfall, n 380
  - slides, costs, n 548
  - toll, *25
- Pan-American Road Congress, members, two classes, 602
- Panama-Pacific Exposition, e 219
  - aeroscope, *423
  - building, design, *229
  - civil engineering and contracting, 619
  - engineering features, *229
  - Engineering Record and McGraw Publishing Co., *759
  - medal award, McGraw Publishing Co., n 787
  - New York State Building, *296
  - Panama Canal model, *434
  - Tower of Jewels, construction, *112
- Paris, water supply, wartime, 279
- Partition, hollow-tile, tests, *432
- Passaic Valley sewer, construction, *130, *292
- Patent, foundation, Court rules valid, 154
  - senate investigates Luten, n 343
- Patterson, I. W.:
  - Bituminous macadam by the coal-mixing method, Abs., *77
- Pavement, asphalt, block, condemned, Abs. 202,
    - wood-fiber, n 809
      - e 415
      - tests, 203
    - costs, Abs., 238
      - Niagara Falls, n 271
    - operating costs, Abs., 238
    - repair, costs, *746
      - old asphalt used, *746
  - bituminous macadam, cold-mixing, *77
  - brick, repair, 662
  - broken concrete as aggregate, Kansas City, *816
  - central gutter, Sacramento, Cal., n 800
  - Chicago, n 51
  - concrete costs in track, *451
    - costs and durability, *530
    - dished surface, costs, *555
    - joint, Abs., 198
    - utility, l 307
  - cracks, study, 314
  - creosoted block, tests, Kansas City, 86
  - cutting and removing, *440
  - dished surface, l 691
  - joint, bituminous filler, Abs., 297
  - laid, day labor, costs, 333
  - laying, street and sidewalk at same time, *440
  - macadam, subgrade, *440
  - Monolithic curb and gutter, cost, *111
  - N. Y. City, standardized, Abs., 202
  - protest against granite between tracks, n 508
  - removal, steam shovel, *59
  - rough, cleaning, n 326
  - sandstone, tests, 203
  - tests, New York City, 203
  - thin concrete base, reinforced, costs, *719
  - vested fiber brick, Kansas City, 546
  - wood, bridge, *164
  - wood-block, cement-sand foundation, 647
    - durability, *53
    - joint fillers applied, n 405
    - Newark, N. J., 116
    - tests, 203
    - and sand, *52, e 35
- Paving mixer, concrete, power-driven distributing spout, *205
- Pay, cash payment advocated, 245
- Peace, military preparedness, 768
- Pearl Harbor, drydock, l 57, e 65, *82
- Pearse, L.:
  - Reject untried sewage treatment methods for Decatur, Abs., 775
- Peck, C. A.:
  - Idle steam shovel is made over into a derrick car, *815
- Pekin, Ill., bridge substructure railroad, *425
- Pennsylvania, stream discharge, data, *109
- Pennsylvania public utility commission, e 36
- Pennsylvania railroad, Chicago, freight terminal, n 804
  - Extra-Crew Repeal Bill vetoed, n 818
  - fire losses, 373
- Pennsylvania Water & Power Co., Haltwood plant, *358
  - efficiency, single-runner wheel, *365
- Pennybacker, J. E.:
  - Recent progress in highway administration, 15
- Pension, Westinghouse Company, 30
- Penstock, covering, prevents freezing, *269
  - failure, Seattle, *471
  - steel, design, *355
  - wood-stave, costs, *356
- Pére Marquette R. R., appraisal report, *200, e 190
- Periodical, engineering, student, e 702
  - technical, catalogue, n 570
- Perrine, H.:
  - Routine tests for determining strength of mortars, *85
- Phares, A. D.:
  - Moving reinforced-concrete hotel in San Francisco, *289
- Phelps, C. J.:
  - Jack-hammer successfully run with steam on sewer trench job, *278
- Phelps, E. B.:
  - Steam disinfection for sewage on common carriers, Abs., *43
- Philadelphia, engineering societies, plan consolidation, n 32
  - Highways bureau, unit cost system, 360
  - subway, construction, starts, 567
- Philippines, irrigation, bamboo watershed, l *814
- Picture, motion, industry, n 696
- Pier, brick, tests, *460
  - bridge, construction, Memphis, Tenn., *518
  - concrete, reinforced, San Francisco, *231
  - construction, forms, *726
  - Forty-sixth street, New York City, cofferdam, n 475, *654
  - municipal, Chicago, construction, *778
  - pavement, costs, *233
- Pier shed, construction, San Francisco, *231
- Pig iron, production, United States, 429
- Pikes Peak, road, automobile, *769
- Pile, driving, *213
    - specifications, e 637, l 784
  - preservation by submarine growth, n 529
  - protection against teredo, Abs., *209
  - pulling, methods, *277
  - wood, specification, l 627
- Pile-driver, steam, operation, *536
- Piling, contract, payment, l 660
- Pipe, cast-iron, placing, *661
  - cement, joint, n 706
  - concrete, sewer, costs, e 219
  - corrugated, culvert, *558
  - failure, New York City, Croton system, *757
    - joint, *409
  - reinforced concrete, replace bridge, *688
  - reinforcement, *785
  - sewer, tests, *711
  - steel, cutting, *469
    - design, *355
  - water, caulking, 408
  - wood, durability, 110
    - repair, Seattle, *507
- Pipe line, costs, *356
    - design, *355
  - erection, *408
  - passes large stone, n 491
  - repair, pontoon used, 755
  - river, without cofferdam, *89
- Pistner, L.:
  - To compute offsets to circular curves, *171, l *244
- Pittsburgh, sewer explosions, n 249
- Point Defiance tunnel, Tacoma, Wash., costs or driving, *272 e 285
- Pole, concrete, durability, *550
- Pond, F. H.:
  - Steam shovel digs 48-inch pipe trench in busy street, n 693
- Pontoon, use in pipe line repair, 755
- Porter, E. A.:
  - Small automobile opens up new opportunities in government stream gaging work, *490
- Portland canal, Louisville, Ky., seepage, prevention, 785
  - Ohio River, lock 41, *794
- Potter, W. G.:
  - Rectangular fire-service reservoir, *260
- Powelson, W. V. N.:
  - Development of waterpower on public lands, Abs., *75
  - Financial safety in waterpower development, including a description of the Nolachuckey hydroelectric plant of the Tennessee Eastern Electric Company, Abs., *175, 202
- Power, electric, contractor's plant, Catskill aqueduct, Kensico dam, *18, e 2
  - San Francisco, gas, *228
- Power: (Continued)
  - steam and water, costs, e 66
  - water, development, public land, *75
  - wood-stave, costs, *356
- Power canal. See irrigation.
- Power site bill, 61
- Power station, water, Moccasin Creek, Cal., *227
- Pratt, R. W.:
  - Three districts for disposal of Cleveland's sewage, Abs., 422
- Public Service Commission, investigation, New York City, e 350
  - New York State, charge dismissed, n 697
- Public works, labor law, effect, e 287
  - unemployment hastens construction, e 511
- Publicity needed, American Water Works Association, 387
- Puget Sound State Bank, decision, e 95
- Pump, centrifugal, Akron, Ohio, filtration plant, *580
  - corrosion, eliminated, *577
  - direct-explosion, irrigation, Texas, *596
  - tests, Abs., 204
- Pumping engine, slippage, defective valve, *598
- Pumping station, Chicago, *73
  - costs, Detroit, 116
  - Indianapolis, Ind., 208
  - Passaic Valley, N. J., *292
  - San Antonio, Texas, *741
- Purification, water, filter, statistics, n 123

## Q

- Quebec bridge, construction, *80
  - traction stresses, *492, e 477
- Quimby, H. H.:
  - Ornamental arch effect secured by cantilever design, Abs., 164
- Quincy, Ill., filtration plant, 424

## R

- Rafter, hip, design, *562
- Rake, grout-mixing, 726
- Ray, G. J.:
  - Screw spikes give satisfaction on Delaware, Lackawanna and Western railroad, abs. 430
- Rail, production, 1914, 442
- Rail section, American Railway Engineering Association, *392
- Railroad, accidents, publicity vs. secrecy, e 95..
  - Alaskan Railway Commission, n 216, n 818
  - British Columbia, North and South, nears completion, n 818
  - Brooklyn Marginal Bill, becomes law, 697
  - construction, preliminary work, 48
    - tunnel, fire repair, Tehachapi, Cal., *797
  - contingencies, cost, 774
  - contract use, suspension from highway bridge, *629
  - ditch, rail support, *502
  - electric, Norfolk & Western, *704
  - electrification, 178, Abs., 394
    - Great Fall Terminal Line, *767
  - elevated, New York City, improvement work, 781
      - steel construction, *86
    - safety, Boston, 300
  - employee, Western arbitration case, e 575
  - engineering prospectus, 4
  - experience, government ownership, Canada, e 478
  - extra-Crew Repeal Bill Vetoed in Pennsylvania, n 818
  - Florida Everglades, construction started, n 817
  - freight terminal, Chicago, problem solved, n 819
  - government ownership, wartime, n 721
  - grade, eliminated, Northern Pacific, *744
  - grade-crossing, eliminated, Chicago, Milwaukee & St. Paul R. R., *722
    - law, *327
    - needless, 455, *674
    - taxation, e 731
  - Great Lakes steamers, ownership prohibited, n 642, e 637
  - industrial, highway work, costs, 653
  - Kettle Valley Railroad in B. C. completed, n 818
  - location, economics, 370
  - locomotive, shop, Bloomington, Ill., *487
  - New Jersey, Full Crew law, e 385
  - operating expense, 298, 743
  - Pennsylvania, testing building and car, *729
  - rail sections, *392
  - reforms, Interstate Commerce Commission, e 1
  - regulation, 121
  - Seward-Susitna route, Alaska, *482, e 477, e 479
  - station, building construction, Spokane, Wash., *235
  - statistics, misleading, e 253
  - steam, operating expenses, n 174
    - statistics, *453
  - street, concrete track, 535
    - Detroit, needs, 427, e 416
    - San Francisco, *223
    - track concreting, costs, *451

*, illustrated articles; l, letters to the editor; e, editorials; n, news of the week and filler notes.

Railroad: (Continued)
  surface, elevated and subway, costs, n 770
  system, operative, part designated, 635
  terminal, Delaware, Lackawanna & Western R.R., Buffalo, N. Y., *334
    commission, recommendations, 758
    Spokane, Wash., *234
  ties, costs, *105, 106
    durability, *105
    seasoning, 105
    screw spikes, e 415
      costs, abs. 430
  track, completion before use, 614
    construction, street, 405
    depreciation, e 732
  train lengths, e 445
  United States, revenue, n 490
  unmerging, e 385
  valuation, *200 e 701, e 190, 728
    conference, 324
    destructive, e 317
    elements, 523
    Federal, 40, 336
    field notes, triangle used, *658
    Interstate Commerce Commission, 485
  Van Buren Bridge, *559
  wash boring, tests, *776
  water tanks, reinforced concrete, *81
  Western Pacific purchase by Government suggested, n 344
  yard extension, Michigan Central R.R., Detroit, 422
Reclamation service, revaluation, 663
Reeve, C. S.:
  Maintenance cost system used on U. S. experimental road, *418, e 415
Refuse disposal, see Garbage disposal
Registration, see Licensing
Reinforced concrete. See Concrete, reinforced
Reinforcement, protection against electrolysis, 465
Report, annual, improvement, l 467, e 512
    suggestions for making, e 254, l 406
Research Bureau workers, e 159
Reservoir, costs, estimated, New York State, 247
  excavation, drag line, *27
  rectangular, fire-service, *260
  seepage, Cedar River, Wash., 62
  water level, n 558
Retaining wall. See Wall, retaining
Richmond tunnel, San Francisco, *228
Rio de Janiero, asphalt plant, *737
  river improvement, reclaim land, *738
  terminals conference, e 318
Rivers and harbors, appropriation by Congress, 345
Rivet, eccentric construction, *l 58, *e 212
  hot, handling, 755
Road, activities, Lincoln Highway Association, 274
  administration, *143
  automobile, construction, Pikes Peak, *769
  bituminous, penetration method, *608, e 605
  bonds, California, n 432
  brick, construction, Florida, l 691
    Florida, e 446 *452
    Ohio, *209
  building, machinery, *295
    Oregon, between Astoria and Warrenton, *295
  California, n 180
  clearing forest, costs, *21
  concrete, 197
    between Whaleyville and Parsonburg, Md., 59
    construction, Connecticut, *480, e 477
    curing under water, *n 27
    flood, damage, n 474
    hydrated lime, experiment, 798
    joint, 310
    placing, 60
    service data, Oregon, 326
  construction, 197
    California, 233
    Canada, 246
    concrete, cost, *676
    costs, *111
      Alaska, *764, e 761
      Louisiana, n 798
    gasoline locomotive, *152
    machinery, *151
    Rhode Island, e 415
    state, convict labor, 751
  costs, 174
    Philadelphia, 360
  development, 15
  earth, Minnesota, *745
  efficiency in work, e 415
  Government to obtain data, 696
  grade, importance, 265
  grouting, Georgia, *342
  hauling equipment, 661
  improvement, e 761
    Colorado, *230
  inspection, cost of automobile, Wisconsin, n 814
  law, proposed by American Highway Association, 249
    revision, American Highway Association and Municipal Research Bureau, N. Y. City, 634
Road: (Continued)
  maintenance, Chelan County, Washington, *520
    cost system, *418, e 415
    truck, n 687
  Massachusetts, year's work, e 533
  material located, New York state, 488
  mountains, Walden's Ridge, *l 437
  New York State, *192, e 189
  nine-foot safer than twelve or thirteen-foot, n 26
  oil for, tests, *329
  planer, *745
  sand-asphalt, Florida, *622, e 670
  sand tests, New York State, *454
  State, Connecticut, e 386
    New Jersey, n 342
  town, as contractor, e 733
  Washington, scenery, *n 82
    unit price system, *174
  year book, n 23
Rochester, N. Y., sewer treatment, *679
Rock sounding, drill outfit, 725
Rockville Pike, road, experiments, *418, e 415
Rogers' Pass, B. C., tunneling, record, n 61, e 189
  tunnel, l 308
Rogers, W. A.:
  From the contractors' point of view, 15
Roller, steam, repairing, *310
Roof, cleaning, *683, e 669
  dust on roof and street, *683, e 669
  long-span slab, construction, *516
Roosevelt dam, overflows first time, n 537
  Phoenix, Ariz., nearly full, 311
Rope, tests, machine invented, 593
Rothschild, Wis., Wisconsin River, dredging, *214
Roundhouse, reinforced concrete, *167, *290
Rowland, W.:
  Experiences gained from reinforced concrete barges built for the Panama Canal, *684

S

Sacramento, Cal., laboratory, testing road material, *329
  trunk sewer, n 461
Sacramento River valley, dikes, costs, *228
  flood prevention, *227
Safeguards, machinery, e 127
Safety, education, e 701
  railroad, l 180
  record, Cumberland Valley Railroad, 103
St. Louis, filters, largest in world, *578
  snow removal, *343
St. Louis Southwestern Railway, St. Louis terminals open, n 642
St. Lucie canal, Florida, excavation work, n 411
Salford, Eng., sewage, aeration, *288, e 285
San Antonio, Texas, water supply station, *741
Sand, analysis, standards recommended, 644
  field tests, portable device, n 821
  filter and concrete, standard terminology, e 671
  Great Lakes, charge royalty, n 472
  importation from Europe, n 620
  unloading plant, floating, *60
  weight, tests, *330
Sand and gravel, plant, *716
Sand and gravel plant, hoist, *742
Sand and stone, measuring box, n 90
Sand testing, economic considerations, *734, e 732, *771, e 791, *801, l 813
  methods, Denver and New York, 551
  outfit, 454, n 821
Sand tests, road construction, *463
Sand-cement, grinding by Danish pebbles, abs 265
San Diego, Volcan Water System, 729
  water supply, 714
    improvements, 810
San Francisco, building, construction since earthquake, *222, e 220
  garbage disposal, *224
    case, 777, e 761, l 813
  hotel, moved, *289
  Panama-Pacific Exposition, auditorium, *237
  power, electric, *228
  Richmond tunnel, construction, *228
  sewerage, *224
  street, railroad, 224, l 406
  tunnel, construction, *224
  Twin Peak tunnel, construction, costs, 47
  water supply, Hetch Hetchy project, e 446
Sanitation, Chicago, schoolboy inspection, e 791
  municipal, fly nuisance, e 511
  war and water, e 127
Santa Fé, see Atchison, Topeka & Santa Fé
Schmidt, H. H.:
  Bituminous filler for granite block in Brooklyn, Abs. 297
Sciotoville, bridge, riveted truss span, longest in America, e 793, *799
Screen, sand, portable, 454
Seabury, G. T.:
  Yardage record at Kensico dam due, in part, to operation of mixers, 199, 213
Seattle, hydroelectric plant, crippled, *471
    reservoir, leakage, 508
  street cleaning, *n 774
  wood-stave pipe repaired, *507
Seepage, Cedar River dam, puddling, n 91
  loss, Cedar River dam, *656
  prevention, 785
    Cedar River dam, 631
    Mississippi levee, 553
  study, Cedar River dam, 600
Sewage, aeration, e 219, n 247
    Lawrence and Manchester compared, 367
    tests, *288, e 285, Abs. *421
  Connecticut, Board of Health control, n 472
  filter underdrains, Abs. *333
Sewage, sludge, Illinois water survey, experiments, Abs. *421
    Lake Michigan Water Commission, *411, e 386
    tests 367
      Baltimore, *521, e 511, l 724
Sewage disposal, Imhoff tanks eliminate odors, *747
  septic tanks, remodeling, e 731
Sewage plant, Decatur, Ill., *495
  statistics, Columbus, Ohio, 492
Sewage treatment, 421
  activated sludge, tests, Baltimore, *288, e 285
  chambers, *433
  Chicago, *709
  Cleveland, Abs. 422
  costs, England, *236
  Decatur, Ill., 775
  development, 10
  disinfection, steam, e 36
      costs, *43
  experiments, Baltimore, e 219
  Fitchburg, Mass., 427, Abs. *332
  Imhoff tank, chamber, 72
  Philadelphia, recommendations, e 638, e 669
  plant, Cincinnati, construction, costs, *38
    construction, *63
    Fitchburg, Mass., 502
    operating costs, *256, e 253
  Rochester, N. Y., *679
  Royal Commission, report, e 478
  sludge tests, n 17
  tests, Baltimore, *e 784
  trade wastes, e 253, *256
    Chicago, *266
Seward-Susitna railroad, Alaska, *482, e 477, e, 479
Sewer, assessment proportioned by consumption, Los Angeles, n 91
  card system for record of service, l*211
  Chicago intercepting to begin, n 820
  construction, Passaic Valley, N. J., *292, *130
  explosions, Pittsburgh, n 249
  flat-top section, *486
  pipe, concrete, costs, Vancouver, B. C., e 219
  Sacramento, Cal., trunk, completed, n 461
  storms water, Indianapolis, *560
  tests for gasoline, Boston, 457
  trench, construction, *278
  tunnel, Mile Rock, construction, *227
Sewer pipe, reinforced concrete, tests, *711
Sewer system, privately financed, Troy, Pa., 79, e 65.
Sewer tunnel, Alton, Ill., 181
Sewerage, Imhoff tank, multiple flowing-through chamber, 72
Sewerage system, Ontario, Canada, 299
  San Francisco, *224
Shackell, L. F.:
  Toxicity of coal-tar creosote for the Xylotrya, 144
Shaft, sinking, jack-hammer, 90
    subway, Broad Street, *522
Shannon, R.:
  Light Traveling Elevator Facilitates Concreting on Building Work, *755
Shawinigan Water & Power Co., penstock protection, *269
Sheepshead Bay, automobile speedway, *739
  Speedway Corporation, arena, construction, 599
Sherman, R. W.:
  River improvement for public health reclaims 10,000 acres of fertile land, *738
Sherrill, C. O.:
  Experimental Mississippi River levees indicate possibility of eliminating seepage, *552
Shore protection, 281
  Revere Beach, *429
Shovel, gasoline, single engine, operates, 205
  steam, *693
    derrick car made, *815
    operation, *68
    safety device, *151
Sickles, R.:
  Form nosing made of curved brackets and sheet iron, *661
  Steam pile-driver operated from boom of revolving shovel, *536
Siphon, wood-stave, failure, Belle Fourche project, *632

*, illustrated articles; l, letters to the editor; e, editorials; n, news of the week and filler notes.

Slab, concrete, l 180
  costs, *170
  formula, 759
 reinforced concrete, N. Y. Code, e 702
Smith, E. A.:
 Wood-stave siphon collapses on Belle Fourche project, *632
Smith, T. A.:
 Concrete warehouse on Brooklyn waterfront rapidly completed despite serious delays, abs. *298
Smith, W. L.:
 Special conditions govern selection of lift bridge and method of erection, abs. *611
Smith, W. M.:
 Arched reinforced-concrete conduits designed by the theory of least work, *648, l 753
Smoke, cause of corrosion, prevention, n 767
Smoke stack, extension, keeps soot from building, n 566
Snoqualmie tunnel, *193
 open, n 62
Snow, fall, record, New York City, n 461
 removal, New York City, *215, e 318, l 437, n 461
  costs, *640, e 637
  efficiency increased, *640, e 637
  St. Louis, *343
 survey, watershed measurement, *494
Societies, co-operation, e 157
Sod, support on embankments, 629
Soil, pressures, vertical, *330
Soltan, D. L.:
 Point defiance line eliminates last heavy grade between Tacoma and Portland, *744
South America, advertising, e 127
 trade, l 58
Southern Pacific, tunnel, fire closes main line, 727
 repair, *797
Southwestern Waterworks Association hold convention in Texas, n 820
Spanish, value to engineer, e 733
Speedway, construction, *686, e 731, l 814
 Sheepshead Bay, *739, e 731
Spike, screw, for railroad ties, e 415, abs. 430
Spofford, C. M.:
 Engineer as city adviser, e 35
Spokane, Wash., bridge, Monroe Street, *235
 railroad station, *235
 Trent Avenue subway, *234
Spring Valley system, San Francisco rejects proposal to purchase, n 537
 San Francisco to vote on purchase, e 446
Springfield, Ohio, city manager, 169
Sprinkler, street, electric, Calgary, Can., *117
Standards bureau, Pittsburgh, brick pier, tests, *460
Starch factory, wastes, Decatur, Ill., n 799
Stark, C. W.:
 Grade-crossing law and its effect on grade-crossing elimination, *327
Steel, construction, handling hot rivets, 755
 definition, e 340
 erection, Second Avenue elevated, New York City, *86
 exhibition of American Bridge Company, at Panama Exposition, n 819
 high-speed, demand, n 614
 I-beam tests, Cornell University, 746
 rafter design, *562
 structural, painting, abs. 428
  straightening, *213
Steinman, D. B.:
 Two time-savers for use with influence lines, *517
Steinway and Brooklyn 4th Ave., subway, opened, n 817
Stern, E. W.:
 Wide column spacing effects economy in factory floor area, *177
Stevenson, W. L.:
 Maintenance of sewers and disposal works demands treatment of injurious trade wastes, *256, e 253
Stimson, E.:
 Mechanical life of ties as affected by ballast, *105
Stingel, E.:
 Causeway at New Philadelphia, Ohio, *78
 Wood block replaces plank as steel bridge flooring, 300
Stockton Street tunnel, San Francisco, *224
 cost, n 208
Stone crusher, repair, welding, *661
Storm King road, *192, e 189
Strachan, R. C.:
 Nomographic solutions for formulas of various types, Abs. *807
Stream, gaging, automobile used, *491
Stream discharge, data, Pennsylvania, *109
Street, cleaning, Seattle, *n 774
Stumps, blasting, cheaper than grubbing, 409
Submarine, design, e 417
Subway accident, New York, 61, e 65
  prevention, n 474
  record, e 95
Subway: (Continued)
 construction, shaft, Broad Street, New York, *522
  starts, Philadelphia, 567
 decking, failure, 600
 design, New York, *448
 New York City, alien labor suit, n 29
  Brooklyn Bridge connection, *76
  construction, Harlem River section, *616
  costs, 1914, 124
  East River tubes, e 810
  new parts opened, e 791
  river tunnel, n 31
 Steinway and Brooklyn 4th Ave., opened, n 817
  timbering, *439
 underpinning, New York, *565
Suction intake, fouling overcome, 555
Sun River, Montana, irrigation, *341
Sunol, filtration plant, *226
Surge tank, concrete, disconnected base, *368
 tests, Tallulah Falls, Ga., *378
Survey, government, local use, *682
Swains, G. F.:
 Deficiency in personality responsible for engineer's failure to receive recognition, abs. 261, e 255
Swasey, A.:
 Engineering Foundation gift, *153

T

Tacoma, Wash., Point Defiance tunnel, roof shield, *272, e 285
Tail-tunnel regulation hydroelectric development, 380, e 350
Tallulah Falls, Ga., surge tank, tests, *378
Tamping, misfire prevention, 816
Tank, placing, method, *629
 steel, moving on barge, *278
Tarrant, F.:
 Maximum use of industrial railway possible at low cost, abs. 653
Taylor, H. B.:
 Do cylinder gates increase turbine efficiency? *485, *690
Taylor, H. W.:
 Privately financed system of sewers, 79, e 65
Tehachapi, Cal., tunnel fire, repair, 727, *797
Telephone, transcontinental, e 128
Tennessee Eastern Electric Company, dam across Nolachuckey River, Tenn., *175, 202
Terminal, freight, Chicago, problem solved, n 819
 water, Beaumont, Texas, *721
Thompson, A. M.:
 Slotted pipe aids placing of hydraulic fill, *534
Thompson, S. E.:
 Concrete and reinforced concrete in 1914, 11
Thunder Creek, bridge, suspension, laying cables, n 341
Ties, railroad, costs, *105, 106
  durability, *105
  seasoning, *105
Tile, hollow, floor and partition, tests, *432
Timber, design, facilitating, 297, l 533
 dry rot, 336, e 317, 400
 preservation, e 127, *209
  creosote-coal tar solution, 398
  creosoted block, pavement, 86
  Douglas fir, 106
  factory, construction, 107
  wood pipes, 110
 removal, costs, *21
 seasoning, 105
 strength, New York State Building, Panama-Pacific Exposition, *296
 tests, temperature, 144
Time study, construction work, 341
Toll, Panama Canal, *25
Torch, oxyacetylene, *n 28
Toronto, filtration plant, new filter, *464
 water purification, e 445
Torresdale filtration plant, costs, Philadelphia, *591, e 573, l 659
Tower, steel, moving, 410
Tower of Jewels, Panama-Pacific Exposition, construction, *112
Towing locomotive, electric, Panama Canal, *134, e 127
Tracings, reproduction, federal valuation, 675
Track, elevation, labor, costs, Chicago, Rock Island & Pacific Railway, *785
 street railway construction, 535
 temporary support over ditch, *502
Tractor hauling, profitable, 629
Trade, South America, l 58
Trade catalogs, uselessness, l 407
Trade commissions, Federal, e 541
Trade wastes, *256, e 253, *266
Traffic regulation, city, e385
Train length, railroad, e 445
Transmission, towers, electric, Cohoes, *677
Transportation, "Jitney" bus, e 221
 on rivers, e 318
Tree, planting in cities, 364
Tree census, Binghamton, N. Y., n 499
Trench, sewer, construction, *278
Trent Avenue Subway, Spokane, Wash., *234
Trent River bridge, substructure, *44
Trestle, concrete, reinforced, *54
 construction, pile driver, *501
 wooden, replaced by embankment, *525
Triangle, railroad, valuation field notes, *658
Triest, W. W.:
 Special conditions govern selection of lift bridge and method of erection, Abs. *611
Trimble, American Railway Engineering Association, president, *381
Truck, automobile, costs, l *214
 load limit, n262
Tunnel, back filled, *715
 bulkhead, Polk street, Chicago, n 804
 Chicago waterworks, *73
 construction, Catskill aqueduct, Cornwall, N. Y., *514
  San Francisco, *228
 costs, n 208
 double-bore system, Rogers' Pass, l 308
 electric haulage, Harecastle Canal tunnel, *234
 leak repaired, 60
 Mont D'Or, e 731
 plan, Hudson River, failure, n 30
 railroad, construction, costs, San Francisco, 47
  roof shield, costs of driving, *272, e 285
 river, New York, subway, n 31
 Rogers' Pass, construction, record, 27
 sewer, 181
  Mile Rock, Cal., *227
 shield, *272, e 285
  rebuilt, Memphis, Tenn., *388
 Snoqualmie, open, n 62
  Twin Peaks, San Francisco, *224
Tunnel lining, *193
 grout, hydrated lime used, 756
Tunneling, pneumatic, Passaic Valley sewer, *130
 record, Rogers' Pass, B. C., e 189, n 61
Turbine, water, bearings, l 437
  casing, l 340
  condensation on housing, *194
  design, Nolachuckey hydroelectric plant, abs. 202
  efficiency, *45, e 35
  efficiency increased by cylinder gates, *485, *690
  for mule-back transportation, *198
  Great Falls Power Co., *183
  largest in world, *154
  new testing flume needed, *379
  one governor controls two turbines, *372
  single-runner, Holtwood plant, *365
  tests, salt solution, *358, e 349
Turntable pit, DuBois, Pa., *167, *290
Twin Peaks tunnel, San Francisco, *224
 construction, 47
Typhoid, Chicago, death rate, n 81, 329
 danger from carriers, e 66
 death rate, Denver, 403
  Milwaukee, 435
Typhus Relief Expedition, Servia, n* 508

U

Underground galleries, Chicago, *53
Underpinning, 450-ton column load, 565
Union Pacific R. R., bridge, Kaw River, *213
"Unit for maintenance cost," 416, l 533
United States Bureau of Standards, autoclave test, 655, e 637
 steel bar deflections, n 653
United States Circuit Court, caisson patent decision, n 787
United States Coast and Geodetic survey, record work, Abs. 807
United States Geological survey, appropriation, 517
 stream gaging, automobiles used, *490
United States mines bureau, life-savers, n 406
United States navy, coal, disuse, e 66
United States Public Health Service, treatment of sewage, experiments, e 219
United States Reclamation service, supervising engineer, position abolished, n 787
United States Steel Corporation, case decision, e 731
United States, water power, development, *136

V

Valhalla, N. Y., Kensico dam, construction, 199, 213
Valuation, land for transportation purposes, 424
 railroad, e 190, e 701, *200
  elements, 523
  by Government, progress, 485
  wash boring, tests, *776

*, illustrated articles; l, letters to the editor; e, editorials; n, news of the week and filler notes.

- Valve, forge, *310
  - needle, *208
  - gate, Catskill aqueduct, *181
  - worm gear, *531
- Van Buren Bridge railroad, *559
- Vancouver, B. C., sewer, construction, 20
  - sewer, pipe, costs, e 219
- Van de Greyn, E. B.:
  - Sand testing at Denver, 551
- Vehicles, horse-drawn decrease, Chicago, n 548
- Ventilation, auditorium, Panama-Pacific Exposition, *237
  - Chicago commission report, e 542
- Viaduct, (See Bridge)
- Victoria, B. C., drydock, wrecked, 247
- Virginian Railway, Elmore, W. Va., coaling station, *22
- Von Schrenk, H.:
  - Specification for a coal tar-creosote solution, 144

W

- Waddell, J. A. L., Japanese government, confers degree, 602
- Walden's Ridge, road, *e 437
- Wall, concrete, nosing construction, *661
  - failure, wind pressure, 567
  - mortar on metal lath, durability, l 660, l 754
  - retaining, infringement decree, Akron, Ohio, 442
    - timber used, *646
- Wanaque water-supply project, 727
- Wacorna, Iowa, hydroelectric plant, *453
- War, engineering problems, e 95
- Warehouse, cotton, New Orleans, *402, e 385
- Wash-water tests, *l 659
- Washington State Supreme Court, decision on contracts, 345
- Wason medal, n 248
- Water, analysis, methylene test, 102
  - consumption, Columbus, Ohio, n 561
    - Denver, n 675
  - filter, drifting sand, *464
  - filtration, B. Coli increase, 621
    - Chicago, *709
    - statistics, e 97
  - hyacinth, hindrance to navigation, Florida, n 526
    - use, Indo-China, n 692
  - iron content, n 526
  - level, gage glass, Cobb's Hill reservoir, n 615
    - regulating gate, *304
    - reservoir, gage glasses, n 558
  - main, construction, records, 566
    - failure, longitudinal compression, *588, e 573
      - New York City, *183
    - repair, costs, n 562
    - tests, *28
    - connection, pipe jetted under pavement, 630
  - measurement, Chicago, e 761
  - meters, Chicago, e 761
- Water: (Continued)
  - power, development, Chicago, *73
    - United States, *136
    - leasing bill, Congress, 602
    - Massachusetts, revision of laws, n 216
    - Minetto, N. Y., n 344
    - tax abolished, Oregon, n 539
    - Wyoming, n 611
  - purification, aluminum sulphate, 394
    - Chicago, n 486
    - costs, abs. *291
    - hydroelectric control, *393
    - liquid chlorine, 280, 338, n 559
    - objection to Government standards, n 555
    - plant, alum plant installed, *576, e 575
      - in proper operation, l 500, e 511
    - portable hypo plant, *373
    - Quincy, Ill., 424
    - Toronto, e 445, l 467
  - rate, decision, Ashland, Wis., *805
  - right, investigation, B. C., n 810
  - softening, lime used, n 120
  - station, suction line, fouling overcome, 555
  - tanks, railroad, reinforced concrete, *81
  - terminal, Beaumont, Texas, *721
  - waste, Chicago, e 761
- Watershed, measurement, snow survey, *494
- Water supply, bacteria, Louisville, n 796
  - case, Ottawa, 156
  - development, 5
  - Fort Worth, Tex., dam, construction, *147
  - high pressure, San Francisco, *222
  - hypochlorite, Milwaukee, n 658
  - industrial consumption, Detroit, n 72
  - Los Angeles, 759
  - Milwaukee, purification, n 559
  - Ottawa, controversy, 62, n 442
  - Paris, wartime, 279
  - San Diego, 714, 729
  - San Francisco, e 446
  - snow survey forecast, *494
  - standards assailed, 313
  - valuation, Dayton, n 74
  - Wharton tract, e 317
  - station, San Antonio, Texas, pumping station, *741
- Waterwheel, bamboo, Philippine irrigation, l *814
  - Troy, N. Y., used 45 years, l *752
- Waterworks, Chicago, *73
  - American Waterworks Association convention, 643, e 573
  - construction, Cumberland, Md., *137
  - Detroit, unit costs, 104
  - meter maintenance systematized, Milwaukee, *587
  - San Francisco, *226, n 247
  - Southwestern Waterworks Association, convention, n 820
- Welding, oxy-acetylene, costs, *182
  - steam roller, *310
- Weldon, F. M.:
  - Paris solves wartime water supply problems, 279
- Welland ship canal, e 605
  - entrance, *458
- West, F. D.:
  - New sedimentation basis will halve costs of sand cleaning at Philadelphia filters, *591, e573, l 659
- West Fork waterworks, dam, construction, *147
- West Ridge sewer, construction, Chicago, *245
- Western Pacific Railway, Government ownership, e 350
  - purchase by California considered, 381
- Western Society of Engineers, entertainment, 305, e 285
  - military reserve, 472
  - national defense plan, 268
  - Protest against abuse of investigating engineers of the water power development of Sanitary District of Chicago, 184
  - wind stresses, investigation, n 539
- Westinghouse Company, pension and insurance, 30
- Wheeling, W. Va., filtration plant, political decision, e 606
- White, F. G.:
  - Suspended fenders a feature of new reinforced-concrete piers at San Francisco, *231
- Wig, R. J.:
  - Bureau of Standards on the autoclave test, 655, e 637
- Wiggin, T. H.:
  - Lead wool for calking flexible-joint pipe lines, n 85
- Wigmore, C.:
  - Floods top unfinished dam—green concrete uninjured, *775
- Wilms, W. H.:
  - Dragline cableways is an effective tool for sand and gravel plants, *716
- Wind stresses, office building, investigation, n 539
- Winnipeg, aqueduct, construction, *594, e 573
- Wisconsin, road, concrete curing, under water, *27
  - River, dredging, *214
  - State Board of Industrial Education, vocational training, e 512
- Wood, A. A.:
  - Defective valves cause slippage in pumping engines, *598
- Wood, L.:
  - Military preparedness an insurance for peace, 768
- Worcester Polytechnic Institute, fiftieth anniversary, 757
- Workmen's compensation law, Supreme Court upholds, n 123
- Worm gear, valve, *531
- Wreckage removal, derrick anchored on truck, n* 501

*, illustrated articles; l, letters to the editor; e, editorials; n, news of the week and filler notes.